

CLAIMS

1. An air bag module comprising:

an inner plate;

a base plate attachable to said inner plate;

5 a cover;

an inflatable cushion, said inner plate being receivable within said cushion, said cushion and said inner plate being receivable within said cover, said cover containing said cushion prior to inflation thereof; and

10 a portion of said cushion and a portion of said cover abutting one another and being sandwiched directly between said inner plate and said base plate such that said portion of said cover is retained between said base plate and said inner plate;

said cushion, said cover, said inner plate and said base plate being retained to one another when the cushion is inflated.

2. The air bag module of claim 1, further comprising a fastener element adapted to extend through said inner plate, said cushion and said base plate, thereby attaching said inner plate and said base plate.

3. The air bag module of claim 2, further comprising an inflator, said inflator having a mounting flange, said fastener element being adapted to further extend through said mounting flange, thereby attaching said inflator with said cushion, said inner plate, said base plate and said cover.

4. The air bag module of claim 3, wherein said cushion, said inner plate, said base plate and said inflator are each formed with an alignable fastener element opening adapted to receive said fastener element through said opening when said fastener element openings are aligned.

5. The air bag module of claim 3, wherein said cushion, said inner plate and said base plate are each formed with an alignable inflator opening adapted to receive a portion of said inflator, wherein said mounting flange of said inflator abuts and is sandwiched between said cushion and said base plate when said inflator is received within said aligned inflator openings and is attached with said cushion, said inner plate and said base plate by said fastener element.

6. The air bag module of claim 3, wherein said cushion, said inner plate and said base plate are each formed with an alignable inflator opening adapted to receive a portion of said inflator, wherein said mounting flange of said inflator abuts an outer surface of said base plate when said inflator is received within said aligned inflator openings and is attached with said cushion, said inner plate, and said base plate by said fastener element.

7. The air bag module of claim 3, further comprising a viscous damping element operable to isolate said inflator so that said inflator can function as a mass damper.

8. The air bag module of claim 7, further comprising a weighting element abutting said inflator and operable to increase the mass dampening function of said inflator.

9. The air bag module of claim 7, wherein said viscous damping element is sandwiched between said inner plate and said base plate, and further comprising:

5 structure operable to at least partially limit compression of said viscous damping element by said attached inner plate and base plate.

10. The air bag module of claim 2, wherein said fastener element comprises a protrusion extending through said inner plate, said cushion and said base plate, wherein said fastener element further comprises a retaining element, said protrusion being secured by said retaining element to attach said inner plate, said cushion,
5 said base plate and said cover together.

11. The air bag module of claim 10, wherein said protrusion is integrally formed with said inner plate.

12. The air bag module of claim 10, wherein one of said retaining element and a portion of the air bag module is comprised of a deformable material, and wherein said one of said retaining element and said portion of the air bag module deforms such that said protrusion is secured by said retaining element.

13. The air bag module of claim 2 wherein said fastener element comprises a threaded stud pressed into said inner plate.

14. The air bag module of claim 2, wherein said fastener element comprises a deformable tab, said deformable tab being deformed to attach said inner plate and said base plate.

15. The air bag module of claim 14, wherein said deformable tab includes a T-shaped foot having a neck portion, wherein said neck portion wedges into said base plate when said deformable tab is deformed, thereby further securing the attachment of said inner plate, said cushion, said base plate and said cover together.

16. The air bag module of claim 2, wherein said fastener element is sufficient to attach said cushion, said inner plate and said base plate to one another, and wherein said air bag module is characterized by the absence of additional attachment

mechanisms to further secure the attachment of said cushion, said inner plate and said
5 base plate to one another.

17. The air bag module of claim 1, wherein said cover includes a cover extension having an inwardly-jutting flange portion, said cover extension being matable with said base plate such that said flange portion abuts and is cupped by said base plate and said cushion abuts and is disposed between said inner plate and said cover extension.

18. The air bag module of claim 17, wherein said base plate forms a segmented channel, wherein said flange portion has opposing inner and outer surfaces, and wherein said channel abuts said outer surface of said flange portion and said portion of said cushion is sandwiched between said inner plate and said inner surface of said
5 flange portion when said cover extension is mated with said base plate.

19. The air bag module of claim 17, wherein said inner plate includes a peripheral wall having an outer surface, wherein said cover extension includes a shoulder portion, said flange portion jutting inward from said shoulder portion, said portion of said cushion being further sandwiched between said peripheral wall and said shoulder portion.

20. The air bag module of claim 17, wherein said base plate is a unitary structure.

21. The air bag module of claim 1, wherein said portion of said cover is cupped by said base plate.

22. An air bag module comprising:

an inflatable cushion;

an inner plate adapted to be receivable within said cushion;

5 a cover adapted to contain said cushion prior to inflation, said cover including cover extensions, said inner plate and said cushion being adapted to be receivable within said cover such that a portion of said cushion abuts and is disposed directly between said inner plate and said cover extensions;

10 a base plate attachable to said inner plate such that said cover extensions abut said base plate and said portion of said cushion and cover extensions are sandwiched directly between said base plate and said inner plate sufficient to prevent separation of the cover from the base plate due to inflation of said cushion when said base plate and said inner plate are attached;

15 fastener elements adapted to extend between said inner plate, said cushion and said base plate, thereby attaching said inner plate and said base plate;

20 wherein said base plate forms a segmented channel, wherein said cover extensions have inwardly jutting flange portions, each of said flange portions having opposing inner and outer surfaces, said cover extensions being matable with said channel such that said flange portions abut and are cupped by said base plate, wherein said base plate abuts said outer surface of each of said flange portions and said portion of said cushion abuts and is sandwiched between said inner plate and said inner surface of each of said flange portions when said cover is mated with said channel; and

25 an inflator, having a mounting flange, said fastener elements being adapted to further extend through said mounting flange, thereby attaching said inflator with said cushion, said inner plate, said base plate and said cover sufficient to prevent separation from one another due to inflation of said cushion.

23. A method of assembling an air bag module comprising:

 providing an inflatable cushion;

 placing an inner plate within said cushion;

5 extending fastener elements between said inner plate and said cushion such that said fastener elements pass through aligned openings in said inner plate and in said cushion;

placing said inner plate and said cushion at least partially within a cover such that a portion of said cushion is sandwiched between said inner plate and said cover;

10 positioning a base plate against said cover to cup a portion of said cover such that said portion of said cushion and said portion of said cover are sandwiched between said inner plate and said base plate; and

 securing said fastener elements to attach said inner plate, said cushion, said cover and said base plate sufficiently to prevent separation of said cover from said
15 base plate and said inner plate due to inflation of said cushion.

24. The method of claim 23, further comprising:

 positioning an inflator at an opening of said inner plate such that said inflator abuts said cushion and said inner plate;

5 wherein said base plate further sandwiches a portion of said inflator between said inner plate and said base plate; and

 wherein said securing said fastener elements attaches said inflator with said inner plate, said cushion, said cover and said base plate.

25. The method of claim 23 further comprising:

 positioning said inflator so that said mounting flange abuts an outer surface of said base plate, wherein said securing of said fastener elements attaches said
5 inflator with said inner plate, said cushion, said cover, and said base plate.

26. The method of claim 23, wherein said fastener elements include a retaining feature, and wherein said securing said fastener elements includes positioning said retaining feature.

27. The method of claim 23, wherein said securing said fastener elements comprises deforming said fastener elements.